

Project Synopsis: Beyond the Schoolhouse Initiative - The Bellwood-Antis School District will collaborate with Antis Township, Altoona City Water Authority, Natural Biodiversity, Mr. Bill Harshman, and the Blair County Conservation District to: 1. create an Outdoor Classroom and 2. hold a Riparian Buffer Restoration Day.

- The educational goal is to teach the Bellwood-Antis school students and the adult community about environmental practices available for sediment, nutrient, and thermal pollution reduction in surface water.
- The changed behavior anticipated from our audience (citizens of Antis Township and Bellwood Borough) is to start implementing best management practices on their property. Practices such as: streamside buffers, rain gardens, rain barrels, and cover crops on cropland and gardens

1. Bellwood-Antis School Administration and teachers are working with Natural Biodiversity, Mr. Bill Harshman, and the Blair County Conservation District to design an Outdoor Classroom. The Classroom will demonstrate ways to live green and to conserve and protect water, soil, and energy.

Natural Biodiversity is a nonprofit whose mission is, "To heal and support the biodiversity of our landscapes and their abilities to sustain themselves and flourish; Engaging citizens and recognizing that they are an interdependent part of the Allegheny Mountains region." Among their programs and initiatives, Natural Biodiversity assisted with the creation of the Juniata Cooperative Weed Management Area partnership and has programs dedicated to controlling invasive, non-native plants and to restoring native plants through holistic habitat-management techniques such as riparian buffers restoration within the Juniata watershed. Kristina Strosnider is the Assistant Director of Natural Biodiversity. Kristina earned a Masters in Landscape Architecture and has worked as an entry-level landscape architect on projects such as stream bank mitigation, urban stream and floodplain improvement, and habitat restoration. NB has awarded a grant to BA to assist with designing the Outdoor Classroom, development of outdoor education curriculum, and some funding towards components of the Outdoor classroom.

Mr. Bill Harshman is a retired Agricultural Educator and member of the community, Bill has experience in landscaping design and is willing to act as a community resource for this project. He is able to donate a pond and offered technical assistance for the installation. The pond will be used as a water feature in the Outdoor Classroom.

Blair County Conservation District staff members are dedicated to preserve, and enhance Blair County's natural resources by providing technical assistance and educational guidance. Beth Futrick, a District staff member, will provide technical support in the development of the Outdoor Classroom, assist with organizing the Riparian Restoration Day and Outdoor Classroom's open house, and seek additional grant funding to purchase trees, shrubs, flower, and other plant material for the buffer and the Classroom. (PACD mini grant to purchase plant material).

Antis Township staff members and supervisors offered time and labor to the Riparian Restoration Day planting and learning activities. Also, they will participate and help promote the open house event at the Outdoor Classroom. The Municipality is interested in collaborating as an active partner because of the need to seek out ways to reduce flooding events in their township. The Municipality's learning objective for this project is to demonstrate how stream buffers, cover crops, pollinator gardens, and rain gardens keep soil from eroding and reduces the velocity of stormwater thus lowering flood events. This partnership is important because the Township's jurisdiction over land use decisions in this community. This project gives them opportunity to discuss their land-use decisions with the public.

The Altoona City Water Authority (supplier for the Bellwood-Antis area) staff members have offered time to assist in the Riparian Restoration Day and participate at open house event for the Outdoor Classroom. The community water authority is invested in this project. The Altoona Water Authority's learning objective for this project is to demonstrate how stream buffers, cover crops, pollinator gardens, and rain gardens planted along streams lowers sediment pollution and reduce stream temperature. Less sedimentation and lower temperature streams are easier and less expensive to treat for drinking. This partnership is important because the Water Authority's jurisdiction over water use decisions in this community. This project gives them opportunity to discuss their water-use policies and practices with the public.

2. The Non-point source problem in this community is erosion of stream-banks along the smaller order streams and the Little Juniata River in the Little Juniata Watershed. Antis Township, Bellwood Borough, and Townships downstream (Snyder Township and Tyrone Borough) have experienced moderate to severe flooding along with polluted runoff. Altered hydrology, including an increase in impervious surface area along

with decreased riparian buffer areas contribute to this problem. Partners fully expected this problem to increase with increased land development in our county. This comes with the completion of a major highway, I-99, and the county's "I-99 Economic Development Plan" which encourages economic growth through tax advantage. This is high risk to water degradation in our county. The ultimate goal of the project is to have public and private landowners retain or restore stream buffers, plant rain gardens, or install other BMPs to decrease polluted runoff and reduce flooding in the face of increasing land development.

**Barriers:** According to survey work conducted by the Blair County Conservation District, the removal of riparian buffers is considered aesthetically pleasing to most of the population in Blair County. Private and public streamside landowners routinely mow riparian buffers striving to maintain a tidy look along streams. The law does not regulate sediment erosion from cut banks. Therefore, the need for streamside landowners to voluntarily implement practices for lowering soil erosion is essential to reduce sediment pollution and slowing stormwater events. Vegetated stream buffers, pollinator gardens, and rain gardens are not a practice many identify as a solution to fix cut banks and flooding. Flooding and the loss of property due to cut stream-banks are what most people notice, however, creating stream buffer areas or planting a rain garden is not typical practices most people take. The misunderstanding of the environmental and stormwater controls these best management practices provide is the barrier that prevents the desired behavior change from the community.

**Objectives:** 1. The Bellwood-Antis School's teachers, administrators, maintenance crew, and students will work with partners to create an Outdoor Classroom in an open courtyard on campus. This Outdoor Classroom will be a classroom for all students of Bellwood-Antis and the community. The Outdoor Classroom will have demonstration areas featuring: a riparian buffer planted around the pond, a pollinator garden, a rain garden, tool shed with gutters, downspouts, and a rain barrel, and a vegetable garden. The Outdoor Classroom will be open to the public— signage will be installed to serve as an educational venue for the public. The signs will describe how the environment is improved and the local water resources protected by using the best management practices at each demonstration area. The goal is to have students act as environmental ambassadors of the Outdoor Classroom. To achieve this goal, each sign will have a QR code, or two dimensional bar code, that can be read using electronic devices that will link the QR code to videos, podcasts and web pages. These media types will provide detailed information regarding the best management practice and its role in reducing erosion. All videos, podcasts and web pages will be created by students after conducting thorough research into the best management practices and issues related to protecting local water resources. The School will have iPod Touches available for the community to "check-out" for self guided tours. The key message of the project will be to convey how planting stream buffers, pollinator gardens, rain gardens, and cover crops can greatly reduce sediment erosion and slow stormwater from quickly charging streams causing flooding. The Blair Conservation District, Altoona Water Authority, Antis Township, and Natural Biodiversity will help Bellwood-Antis School organize an open house event at the Outdoor Classroom. The event will be well publicized inviting the community to attend. Members of the student body will demonstrate the use of QR codes and readers and give tours of the Classroom. Each partner will have an activity such as demonstrating the Envioscape or River Lab.

Once necessary electronic devices, such as iPod Touches, are purchased, free applications can be downloaded to the devices in order to read the QR codes. Subsequent upgrades for both the iPod Touches and QR codes are also free of purchase. In addition, community members who have "smart phones" – cell phones that have Internet access, can access information about the protection of local water sources via the QR codes, making this addition of an emerging technology a multimedia experience – one that can serve as a prototype for other school districts. Not only can visitors see the various components of the Outdoor Classroom, but they can see and hear student generated explanations and demonstrations of how to better preserve and protect our environment.

For more information about QR and how they can be incorporated into educational activities, please visit the following web site: <http://techapalooza-2010.iu1.wikispaces.net/Mobile+Learning+with+QR+Codes>; <http://itcboisestate.wordpress.com/2011/02/18/10-ways-to-use-qr-codes-in-your-classroom>

2. The second objective of this project is complementary to the first objective. The students of Bellwood-Antis Middle School will work with Antis Township supervisors and staff to plant a riparian buffer at a local township park. Staff members of the Blair Conservation District, Water Authority, and Natural Biodiversity will assist with the tree planting. Also, the partners will hold break-out sessions with the students to teach water testing and macroinvertebrates identification. The Township Supervisors will join

staff members of the Altoona Water Authority to conduct a second break-out session. This session the Supervisors will discuss their role in the community. They will explain how they make land-use decision that impact our community and discuss the importance in using methods to reduce sediment pollution and stormwater runoff. The Water Authority staff will teach the students how sediment pollution causes extra work and costs to clean water for drinking. They will explain their role in water-use decision making, and how they provide safe drinking water for the community. In return, students will teach the partners about how stream-bank erosion is reduced by planting riparian buffers by demonstrating with the River Lab. Because students and adults will be learning/teaching together the Key Message for this project is: "Working across the generation gap...together...to protect our water resources".

**3. Our target audience members are the people of Antis Township and the surrounding municipalities.** All landowners in the Little Juniata watershed need to be aware of methods to reduce sediment erosion and help control stormwater from their properties. Communities in the lower end of this watershed suffer severe flooding events. Over four miles of the Little Juniata is impaired due to sediment pollution cause low dissolve oxygen levels. Half of the impaired segment is located in Antis Township and is only a few miles from the Outdoor Classroom and Riparian Demonstration site.

#### **4. Spring of 2011 – Fall of 2011 - Outdoor Classroom**

- Bellwood-Antis School District will work with Natural Biodiversity, Mr. Bill Harshman, and Blair Conservation District to design and install the outdoor classroom.
- The students will implement the landscape design: plant riparian buffer, plant pollinator garden, prepare vegetable garden, build work-shed, build platform for the signage.
- Students will research material and create the pod-casts for the QR Readers. The podcast will complement the signs at various demonstration areas in the outdoor classroom.
- The School and Antis Township will host an open house to showcase the Outdoor Classroom. During the open house, Blair Conservation District will show "Trees Beside the Water" and have the River Lab and Envioscape set-up for students to demonstrate how watersheds function.
- Survey of the open house attendees will be conducted by the students, teachers, and partners to evaluate the communities understanding on how water quality, flood mitigation, and stormwater control can be accomplished through the installation of best management practices.
- Media coverage will be arranged for the Riparian Restoration Day and the Outdoor Classroom open house

Fall of 2011- Riparian Restoration Day - The program for this day will be in three stations: 1. Students and local government members will plant PA native trees and shrubs in a riparian area in Antis Township Park. 2. Altoona Water Authority and Blair Conservation District will teach a lesson on macroinvertebrates and water chemistry. 3. Local government/student exchange of presentations:

- The students will prepare and deliver a "River Lab" presentation for the local government staff members, township supervisors, and water authority staff members.
- The local government staff members, township supervisors, and water authority staff members will deliver a presentation to the students. They will discuss their role as local civic leaders; describe their objectives for riparian buffer establishment and how they protect our water resources.

**5. Hydrologic Unit Code: 02050302-Upper Juniata (Little Juniata River).** PADEP lists 4.16 miles of this stream as impaired. Approximately 2 miles of the impaired segment is located in Antis Township just south of the proposed projects listed in this proposal. Impairment is due to Municipal Point Source Organic Enrichment and Urban Runoff/Storm Sewers causing low dissolved oxygen levels.

Antis Township Comprehensive Plan States: The goal is to conserve, protect and properly utilize the Natural Resources of Antis Township. The objective to "preserve environmentally sensitive areas and the abundant water resources of the Township" matches the goals of the project. Also, Antis Township' Comprehensive Plan recommends continuing to strictly enforce their stormwater management ordinance, not only to protect the wellheads, but to also protect the creeks and streams of the Township and surrounding areas. This recommendation also matches the goals of this project. The learning objectives anticipated with this project will help implement the Township's natural/water resources plan.

#### **6/7. Milestone - Create the Outdoor Classroom**

Tasks - Bellwood-Antis students and teachers will work with:---Natural Biodiversity who will provide landscaping designs--- Mr. Bill Harshman who will assist in the installation of the pond and pump--- Blair CD and Natural Biodiversity who will assist with planting all garden areas. The students and teachers will build

sign stands and other hard features for the Classroom. The students will research best management practices and issues related to protecting local water resources before creating the signage and QR reader's podcasts.

Target Date - April 2011 – October 2011

Measurable Results - Student's knowledge about best management practices and water quality issues will be measured by the teaching staff before podcasts are created. Level of knowledge will be satisfactory or better.

Milestone – Riparian Buffer Restoration Day

Tasks - Bellwood-Antis students and teachers will work with Natural Biodiversity, Antis Twp, Altoona Water Authority, Blair CD to plant a 300 foot riparian buffer in Antis Twp Park. Students and Partners will hold breakout sessions to conduct learning activities in conjunction with the tree planting.

The local TV station, Tyrone Herald newspaper, and the Altoona Mirror newspaper will be invited

Target Date – September 2011

Measurable Results - Students will prepare ahead by learning how to use the River Lab and learn how to conduct a presentation using the River Lab. Students will learn: how to properly plant trees, about PA native plant species, and about job duties of local government and water authorities that influence water/land uses and the importance of managing our local land and water resources. Township supervisors, Water Authority staff, and other partners will learn: (via River Lab) the mechanics of stream-banks erosion and how this is accelerated when buffers are destroyed.

Milestone – Outdoor Classroom Open House

Tasks – Students and teachers will conduct tours of the Outdoor Classroom. Partners will “man” the displays/demonstration sites. The displays will show each partner's organization and how each help protect water resources.

Target Date – October 2011

Measurable Results – The community members who attend will be surveyed. The survey will measure: the change in understanding the different types of best management practices that reduce stream-bank erosion, stormwater problems and what creates the problems, and methods for flood mitigation. Survey will also measure: how many attendees saw media coverage on the riparian restoration day and how many plan to visit the Antis Township Park's buffer area.

**8.** - This grant funding will be used to purchase the educational signs and the QR codes for the pod-cast component. The QR codes are a one-time purchase cost. However, the pod-casts can be able changed to keep current with new developments in the Outdoor Classroom --therefore the learning experience is not static. The signs will remain in the Outdoor Classroom for future students and community members to enjoy.

**9.** -The survey conducted at the open house is how this project will be evaluated. It is anticipated over 100 people will attend the open house. Tracking will be done by Bellwood-Antis HS/MS by recording the number of people using the available I-touch for self guided tours through the Outdoor Classroom. Future tracking of this project will be done by the Blair Conservation District by tracking any increased requests for rain barrel and other types workshops in this community.

**10.** -The Outdoor Classroom and the Township Park's riparian buffer will remain in the community and serve as educational areas. The Outdoor Classroom will be a valuable educational tool for the community to learn about water quality and methods to live more green. With the QR Reader technology, pod-casts can be updated, thus keeping the water resource education current and relevant.

**Source and description of 5% overall WREN Grant match**

Blair Conservation District	\$2000 Cash Applied
Blair Conservation District	\$500 Cash In hand
Natural Biodiversity	\$1000 In-kind
Blair Conservation District	\$600 In-kind
Altoona Water Authority	\$400 In-kind
Antis Township	\$1000 Labor
Antis Township	\$600 In-kind
Mr. Bill Harshman	\$800 Cash Value
Mr. Bill Harshman	\$800 In-kind
Bellwood-Antis School District	\$2400 In-kind
Bellwood-Antis School District Maintenance Staff	\$3000 Labor
Bellwood-Antis PTO	\$2000 Cash In hand